Applicant notes with appreciation the Examiner's indication that claims 30-31 contain allowable subject matter. Claims 30-31 have been rewritten in independent form so as to place them in condition for allowance.

Claim 29 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Yoshida in view of Hsieh. This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 29 requires that "each of the plurality of pixel areas is a liquid crystal region including a reflection area for performing display using reflected light and a transmission area for performing display using transmitted light . . . wherein <u>a thickness (dl) of the liquid crystal layer in the transmissive electrode region and a thickness (d2) of the liquid crystal layer in the reflective electrode region are defined by a relationship d1 > d2, and wherein thickness d1 is substantially larger than thickness d2 so that electrooptical characteristics of the reflection area and the transmission area are approximately matched</u>." Yoshida and Hsieh each fail to disclose or suggest this underlined aspect of claim 29.

Yoshida allegedly discloses a pixel electrode layer(s) M that includes both a mostly reflective layer 813a and a transmissive ITO layer 813b (e.g., see Figs. 11 & 14; col. 22, line 44 through col. 23, line 20; and col. 24, lines 9-24). Fig. 14 of Yoshida allegedly shows that mostly reflective layer 813a overlies transmissive ITO layer 813b, so that light that can pass through defect areas k (i.e., holes) in the reflective layer 813a can also pass through ITO layer 813b. On page 6, the Office Action contends that because of holes k in layer 813a, the liquid crystal (LC) thickness dl in transmissive

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regions is greater than LC thickness d2 in reflective regions (see drawing in body of Office Action). However, the Office Action's interpretation of Yoshida is incorrect due to the necessary presence of the alignment layer that overlies layer 813a and thereby fills in holes k. For example, see alignment layer 222 in Fig. 11 of Yoshida which overlies the pixel electrode M (and thus layer 813a) and thus fills in any defects/holes k in the same. Because of the alignment layer 222, and its filling in of holes k, the LC thickness is the *same* (not different as required by claim 29) in both of the alleged transmissive and reflective regions in Yoshida.

Moreover, claim 29 requires that "thickness d1 is substantially larger than thickness d2 so that electrooptical characteristics of the reflection area and the transmission area are approximately matched." This cannot possibly occur in Yoshida (even if the alignment film were not present) due to the extremely small sizes of the defect areas k. The other cited art cannot overcome this fundamental flaw in Yoshida. Accordingly, it can be seen that even if the references were combined as alleged in the Office Action (which applicant believes would be incorrect in any event), the invention of claim 29 still would not be met.

Experimental data attached hereto as Exhibit 1 illustrates the advantages of an example embodiment of claim 1 over the cited art. In particular, the two yellow highlighted lines (i.e., solid line and dotted line) illustrate that when d1 is substantially greater than d2, then electrooptical characteristics (e.g., light intensity) can approximately match in the transmissive and reflective regions. In Exhibit 1, the yellow-highlighted dotted line is indicative of the LC being 5.0 μm thick in the transmission region (d1 –

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dotted line), whereas the yellow-highlighted solid line is indicative of the LC being 2.5 μm thick in the reflection region (d2 – solid line). It can be seen that when d1 is substantially greater than d2 as in this case, certain electrooptical characteristics can be approximately matched in the two regions. In contrast, if d1 and d2 are approximately the same as in Yoshida, Exhibit 1 shows that electrooptical characteristics are much different in the two regions; compare the yellow-highlighted solid line of Exhibit 1 which is indicative of a 2.5 μm thickness in the reflection region with the two bottom-most lines in Exhibit 1 (-△-and-○-lines) which are indicative of 2.52 μm and 2.5 μm thicknesses respectively in the transmission region.

Claim 32 and new claim 35 require that "the second conductive layer having the high property of light reflection, but not the first conductive layer, overlaps at least part of a channel area of a transistor with which the first and second conductive layers are in electrical communication." For example, see Fig. 25 of the instant application where reflective electrode 61 (second conductive layer having property of light reflection), but not the transmissive electrode, at least partially overlaps the channel region of the underlying TFT. Yoshida fails to disclose or suggest this. In contrast, Yoshida's layers 813a and 813b are substantially coextensive. Thus, Yoshida cannot disclose or suggest one of the layers, but not the other, at least partially overlapping the TFT channel. Yoshida teaches directly away from the aforesaid aspect of claim 35. Citation to additional art cannot cure the fundamental flaws associated with Yoshida discussed above. Claims 32 and 35 clearly define over the art of record for at least this reason.

New claim 37 requires that "a first conductive layer having a high property of light transmission efficiency provided in the transmission area and a second conductive layer having a high property of light reflection efficiency provided in the reflection area are formed in correspondence with each pixel area on the second substrate, and the first conductive layer and the second conductive layer are formed as independent layers to each other, and an <u>insulation layer is provided between the first conductive layer and the second conductive layer; and wherein the insulation layer comprises an organic resin, and a surface of the insulation layer to be formed on the second conductive layer comprises a wave-like surface shape, and the surface of the second conductive layer comprises a wave-like surface shape</u>. " The cited art fails to disclose or suggest at least the aforesaid underlined aspect of new claim 37.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. The application is believed to be in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

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Respectfully submitted,

NIXON & VANDERHYE P.C.

By: ___________________
Joseph A. Rhoa
Reg. No. 37,515

JAR:caj
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

29. (Amended) A liquid crystal display device comprising:

a first substrate and a second substrate;

a liquid crystal layer interposed between the first substrate and the second substrate;

a first polarizer provided on a surface of the first substrate which is opposite the liquid crystal layer;

a second polarizer provided on a surface of the second substrate which is opposite the liquid crystal layer;

a first phase compensation element provided [betweeen] <u>between</u> the first polarizer and the liquid crystal layer; and

a second phase compensation element provided between the second polarizer and the liquid crystal layer,

wherein a plurality of pixel areas are provided for display, each of the plurality of pixel area<u>s</u> is a liquid crystal region including a reflection area for performing display using reflected light and a transmission area for performing display using transmitted light, wherein a reflective electrode region defining the reflection area and a transmissive electrode region defining the transmission area are formed in correspondence with each pixel area on the second substrate, and

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wherein a thickness (dl) of the liquid crystal layer in the transmissive electrode region and a thickness (d2) of the liquid crystal layer in the reflective electrode region are defined by a relationship d1 > d2, and wherein thickness d1 is substantially larger than thickness d2 so that electrooptical characteristics of the reflection area and the transmission area are approximately matched.

30. (Amended) A liquid crystal display device comprising:

a first substrate and a second substrate;

a liquid crystal layer interposed between the first substrate and the second substrate;

a first polarizer provided on a surface of the first substrate which is opposite the liquid crystal layer;

a second polarizer provided on a surface of the second substrate which is opposite the liquid crystal layer;

a first phase compensation element provided betweeen the first polarizer and the liquid crystal layer; and

a second phase compensation element provided between the second polarizer and the liquid crystal layer,

wherein a plurality of pixel areas are provided for display, each of the plurality of pixel areas comprises a reflection area for performing display using reflected light and a transmission area for performing display using transmitted light, wherein a reflective

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electrode region defining the reflection area and a transmissive electrode region defining the transmission area are formed in correspondence with each pixel area on the second substrate,

wherein a thickness (dl) of the liquid crystal layer in the transmissive electrode region and a thickness (d2) of the liquid crystal layer in the reflective electrode region are defined by a relationship d1 > d2, and [A liquid crystal display device according to claim 29,] wherein the relationship is d1 = 2 x d2.

31. (Amended) A liquid crystal display device comprising:

a first substrate and a second substrate;

a liquid crystal layer interposed between the first substrate and the second substrate;

a first polarizer provided on a surface of the first substrate which is opposite the liquid crystal layer;

a second polarizer provided on a surface of the second substrate which is opposite the liquid crystal layer;

a first phase compensation element provided betweeen the first polarizer and the liquid crystal layer; and

a second phase compensation element provided between the second polarizer and the liquid crystal layer,

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wherein a plurality of pixel areas are provided for display, each of the plurality of pixel areas comprises a reflection area for performing display using reflected light and a transmission area for performing display using transmitted light, wherein a reflective electrode region defining the reflection area and a transmissive electrode region defining the transmission area are formed in correspondence with each pixel area on the second substrate,

wherein a thickness (dl) of the liquid crystal layer in the transmissive electrode region and a thickness (d2) of the liquid crystal layer in the reflective electrode region are defined by a relationship d1 > d2, and [A liquid crystal display device according to claim 29,] wherein the relationship is d1 > 2 x d2.

32. (Amended) A liquid crystal display device comprising:

a first substrate and a second substrate;

a liquid crystal layer interposed between the first substrate and the second substrate; and

a plurality of pixel areas provided for display, each of the plurality of pixel areas including a reflection area for performing display substantially in a reflection mode using reflective light, and a transmission area for performing display substantially in a transmission mode using transmitted light, wherein the reflection area and the transmission area are laterally discrete within the pixel area;

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wherein a first <u>uniform</u> conductive layer having a high property of light transmission efficiency provided in the transmission area and a second <u>uniform</u> conductive layer having a high property of light reflection efficiency provided in the reflection area are formed in correspondence with each pixel area on the second substrate, and the first conductive layer and the second conductive layer are formed as independent layers to each other <u>so that the first uniform layer having light transmission is not provided in substantially entire areas of respective pixel areas; and</u>

<u>wherein in at least one pixel the second conductive layer having the high property of light reflection, but not the first conductive layer, overlaps at least part of a channel area of a transistor with which the first and second conductive layers are in electrical communication</u>.

Please add the following new claims:

35. (New) A liquid crystal display device comprising:

a first substrate and a second substrate;

a liquid crystal layer interposed between the first substrate and the second substrate; and

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a plurality of pixel areas provided for display, each of the plurality of pixel areas including a reflection area for performing display using reflective light and a transmission area for performing display using transmitted light;

wherein a first conductive layer having a high property of light transmission efficiency provided in the transmission area and a second conductive layer having a high property of light reflection efficiency provided in the reflection area are formed in correspondence with each pixel area on the second substrate, and the first conductive layer and the second conductive layer are formed as independent layers to each other; and

wherein in at least one pixel the second conductive layer having the high property of light reflection, but not the first conductive layer, overlaps at least part of a channel area of a transistor with which the first and second conductive layers are in electrical communication.

36. (New) The display device of claim 32, wherein a ratio of transmission area to reflection area in each pixel area is on the order of about 40:60.

37. (New) A liquid crystal display device comprising:

a first substrate and a second substrate;

a liquid crystal layer interposed between the first substrate and the second substrate; and

a plurality of pixel areas provided for display, each of the plurality of pixel areas including a reflection area for performing display using reflective light and a transmission area for performing display using transmitted light;

wherein a first conductive layer having a high property of light transmission efficiency provided in the transmission area and a second conductive layer having a high property of light reflection efficiency provided in the reflection area are formed in correspondence with each pixel area on the second substrate, and the first conductive layer and the second conductive layer are formed as independent layers to each other, and an insulation layer is provided between the first conductive layer and the second conductive layer; and

wherein the insulation layer comprises an organic resin, and a surface of the insulation layer to be formed on the second conductive layer comprises a wave-like surface shape, and the surface of the second conductive layer comprises a wave-like surface shape.

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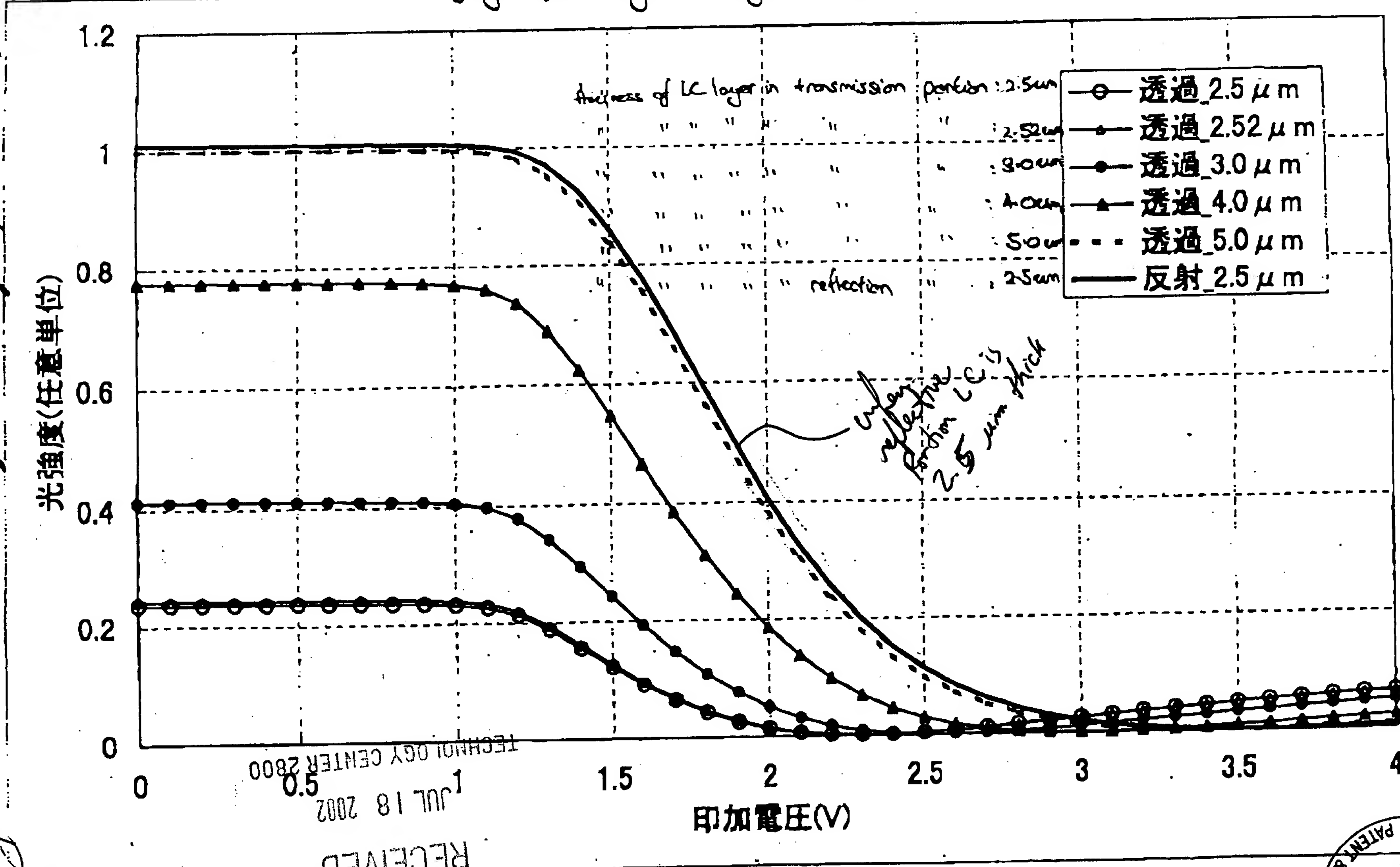
Graph of output light intensity vs loading voltage for different portions (transmission or reflection) of a pixel for varying liquid crystal layer thickness



loading voltage (V)

Exhibit 1